

128x128 Ultra-High Density Optical Interconnect, Phase I

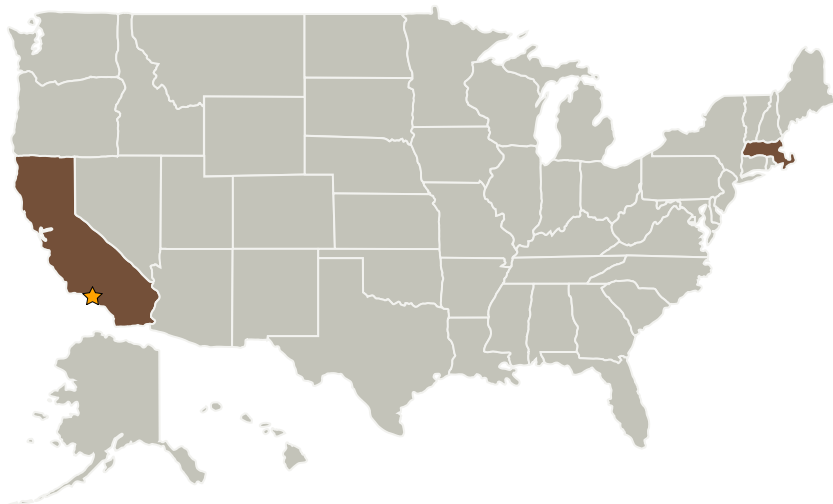
Completed Technology Project (2004 - 2004)



Project Introduction

Future NASA programs like Tertiary Planet Finder (TPF) require high density deformable mirrors with upto 16,000 actuators to enable direct imaging of planets around distant stars. Xinetics has been developing high density module actuator arrays that will enable deformable mirrors to be fabricated with array sizes upto 128 by 128. These monolithic actuator arrays have eliminated the need for discrete wires by using internal electrical conductors that terminate at the back of the module. Concepts for electrical attachment using Ball Grid Arrays (BGA), Pin Grid Arrays (PGA) and conductive epoxies have been developed to allow laboratory testing and evaluation, but reliable interconnect technology must be developed that will allow the module mirror technology to meet space qualification requirements. Environmental requirements for the interconnect include radiation, mechanical, thermal and life cycle loads. The interconnect must also survive subsequent assembly processes including thermal and coating vacuum cycles. We are proposing under Phase I to investigate electrical interface options, materials and processes for the module arrays compatible with future space qualification requirements. During a follow on Phase II a high density interconnect for a full scale 128 by 128 mirror would be built and assembly processes qualified with rigorous testing.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Xinetics, Inc.	Supporting Organization	Industry	Devens, Massachusetts

Primary U.S. Work Locations

California	Massachusetts
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

John B Wellman

Technology Areas

Primary:

- TX14 Thermal Management Systems
 - └ TX14.2 Thermal Control Components and Systems
 - └ TX14.2.8 Measurement and Control